## REMARKS/ARGUMENTS

Claim 1 has been amended to recite "a chamber," "at least one gas generant formulated to pyrotechnically produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide," and "the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture comprising carbon dioxide in a concentration less than or equal to the concentration pyrotechnically produced by the at least one gas generant." Claim 57 has been amended to recite "igniting at least one gas generant to produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health value" and "dispersing the inert gas mixture comprising carbon dioxide in a concentration less than or equal to the concentration pyrotechnically produced by the at least one gas generant." Claim 107 has been amended to recite "at least one gas generant formulated to pyrotechnically produce an inert gas mixture comprising less than approximately 4% by volume of carbon dioxide, the at least one gas generant comprising hexa(ammine)cobalt(III)nitrate and guanidine nitrate" and "the fire suppression system configured to dispense, at an exit thereof, the inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant." Support for the amendments is found in the as-filed specification at at least paragraphs [0021], [0023], [0051], and [0055].

Claim 3 has been amended to incorporate a portion of the subject matter of claim 1. Claims 18, 19, and 26 have been amended to correct claim dependencies. Claims 24, 59, and 72 have been amended to improve antecedent basis. New claim 115 has been added. Support for the new claim is found in the as-filed specification at at least paragraph [0021]. No new matter has been added.

The Office Action mailed July 12, 2007, has been received and reviewed. Claims 1-5, 7-16, 18-67, 69-90 and 94-114 are currently pending in the application, of which claims 1-5, 7-16, 18-28, 31-65, and 69-78 are currently under examination. Claims 29, 30, 66, 67, 79-90, and 94-114 are withdrawn from consideration as being drawn to a non-elected invention or non-elected species. Claims 1-5, 7-16, 18-28, 31-65 and 69-78 stand rejected. Applicants have amended claims 1, 3, 18, 19, 24, 26, 57, 59, 72, and 107, added new claim 115, and respectfully request reconsideration of the application as amended herein.

**Election of Species Requirement**

In the Office Action Summary, the Examiner indicates that claims 29, 30, 66, 67, 79-90 and 94-114 are withdrawn from consideration.

However, as detailed in Applicants' responses filed on March, 24, 2006, and August 14, 2006, the Election of Species Requirement regarding claims 29, 30, and 83-90 should be withdrawn. Since arguments for withdrawing the species election of these claims were provided in the above-mentioned responses, the arguments are not repeated herein. While the Examiner withdrew the species election of claims 26-28 and 31-56 in the Office Action dated November 17, 2006, the Examiner did not withdraw the species election of claims 29, 30, and 83-90. However, the Examiner also did not provide any reasons for maintaining the species election of these claims.

As detailed in Applicants' response filed on May 29, 2007, the Election of Species Requirement regarding claims 66, 67, 79-82, and 94-114 should also be withdrawn. In regard to claims 66 and 67, the Examiner indicated that these claims are withdrawn as being identical to withdrawn claims 29 and 30, respectively. However, claims 66 and 67 are not identical to claims 29 and 30 because the former claims recite method-like limitations and are dependent on a method claim (claim 57), while the latter claims recite composition of matter-like limitations and are dependent on an apparatus claim (claim 1). In addition, since the Examiner has not provided reasons for maintaining the species election of claims 29 and 30, Applicants are unclear of the reasons for maintaining the withdrawal of claims 66 and 67.

In regard to claims 79-82, these claims were pending in a previous Office Action (mailed November 17, 2006). Since subsequent Office Actions have not provided reasons for withdrawing these claims, Applicants are unclear of the reasons for the withdrawal of these claims.

The Examiner also indicates that claims 94-114 are withdrawn from consideration as being directed to a non-elected invention. However, claims 94-100 depend directly or indirectly on claim 1 and, therefore, are allowable, *inter alia*, as depending from an allowable base claim. Similarly, claims 101-106 depend directly on claim 57 and, therefore, are allowable, *inter alia*, as

depending from an allowable base claim. Therefore, contrary to the Examiner's assertion, claims 94-106 are not directed to a non-elected invention. Claims 107-114 are also not directed to a non-elected invention because these claims are directed to a fire suppression system, as are pending claims 1-5, 7-16, 18-56, and 79-86.

Since Applicants are unclear of the reasons for withdrawing claims 29, 30, 66, 67, 79-90 and 94-114, Applicants are unable to prepare arguments responding thereto.

As a result, claims 1-5, 7-16, 18-67, 69-90, and 94-114 should be under consideration. Applicants respectfully request confirmation of the status of these claims from the Examiner.

**35 U.S.C. § 103(a) Obviousness Rejections**

Obviousness Rejection Based on U.S. Patent No. 6,116,348 to Drakin in View of U.S. Patent No. 6,016,874 to Bennett

Claims 1-5, 7-10, 13, 14, 18, 22-25, 57, 58, 60-65, 69, 72-75, 77, and 78 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,116,348 to Drakin ("Drakin") in view of U.S. Patent No. 6,016,874 to Bennett ("Bennett"). Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, there must be "a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The obviousness rejection of claims 1-5, 7-10, 13, 14, 18, 22-25, 57, 58, 60-65, 69, 72-75, 77, and 78 is improper because the applied references do not teach or suggest all of the claim limitations. In addition, there is no reason that would have prompted combination of the applied references.

Drakin teaches a device for extinguishing a fire that includes a pyrotechnic composition. Drakin at column 1, lines 5-10. Upon ignition, the pyrotechnic composition produces a gas and aerosol mixture that includes hydrogen, oxygen, ammonia, and carbon-containing gases, such as carbon monoxide ("CO") and methane ("$CH_4$"). *Id.* at column 4, lines 1-21 and Table 1. The pyrotechnic compositions include carbon-containing ingredients, such as dicyaneamide, phenol formaldehyde resins, epoxy resins, and ballistite powder (nitrocellulose and nitroglycerin). *Id.* at Table 1. The gas and aerosol mixture is passed through an oxygen-containing oxidizer, which decomposes to oxygen. *Id.* at column 4, lines 1-21. The oxygen reacts with the gas and aerosol mixture and incompletely oxidized combustion products to produce carbon dioxide ("$CO_2$"), water ("$H_2O$"), and nitrogen ("$N_2$"). *Id.* The gas and aerosol mixture is cooled using a solid coolant. *Id.* at column 4, lines 31-32. The cooled mixture is filtered and the resulting vapor, gas, and aerosol mixture is discharged into a space having a fire. *Id.* at column 7, lines 24-33. The discharged mixture includes a gaseous phase and a solid phase. *Id.* at column 7, lines 18-23.

Bennett teaches a fire extinguishing system that includes a compressed inert gas tanks and solid propellant gas generators. Bennett at the Abstract. The compressed inert gas tanks include inert gases 2, such as argon, carbon dioxide, or combinations thereof. *Id.* The solid propellant gas generators produce nitrogen, carbon dioxide, or combinations thereof when ignited. *Id.* The gases from the compressed inert gas tanks and solid propellant gas generators are combined to produce a composition that includes 52% by volume of nitrogen, 40% by volume of argon, and 8% by volume of carbon dioxide. *Id.* at column 3, lines 62-66. This composition (52% $N_2$, 40% Ar, and 8% $CO_2$) is released from the fire extinguishing system through a discharge nozzle and into compartment where a fire is located. *Id.* at column 3, lines 51-61.

The applied references do not teach or suggest all of the limitations of amended claim 1 because Drakin and Bennett, alone or in combination, do not teach or suggest the limitations of "the at least one gas generant formulated to pyrotechnically produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to

Life or Health concentration of carbon dioxide" and "the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture comprising carbon dioxide in a concentration less than or equal to the concentration pyrotechnically produced by the at least one gas generant."

In regard to the former limitation, while the gases produced by combustion of the pyrotechnic composition used in the device of Drakin include $CO_2$, nothing in Drakin teaches or suggests that the $CO_2$ is present at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide. Similarly, while the solid propellant gas generators used in the fire extinguishing system of Bennett produce nitrogen, carbon dioxide, or combinations thereof when ignited, nothing in Bennett teaches or suggests that the $CO_2$ is present at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide.

In regard to the latter limitation, the mixture discharged from the device of Drakin includes $CO_2$, $H_2O$, $N_2$, and solid particles. Since the mixture discharged from the device of Drakin includes solid particles, the mixture is not an "inert gas mixture" as recited in claim 1. In addition, Drakin does not teach or suggest that its mixture, as it exits the device, includes "carbon dioxide in a concentration substantially equal to the amount pyrotechnically produced by the at least one gas generant," as recited in claim 1. In Bennett, the composition exiting the fire extinguishing system includes 8% $CO_2$, which is not substantially equal to the concentration of carbon dioxide pyrotechnically produced by the solid propellant gas generators of Bennett.

In addition, there is no reason in the prior art, common knowledge, or the nature of the problem itself that would have prompted combination of the applied references. The Examiner states that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the device of Drakin by replacing the inert gas mixture with an inert gas mixture substantially free of carbon containing gases as taught by Bennett to reduce the effects on the environment." Office Action of July 12, 2007, p. 2. However, contrary to the Examiner's assertion, the composition released from the fire extinguishing system of Bennett includes 8% $CO_2$. In addition, since the device of Bennett includes compressed inert gas tanks and solid propellant gas generators that, in combination, produce a composition (52% $N_2$, 40% Ar, and 8% $CO_2$) to be released from the fire extinguishing system, the applied references would not provide one of ordinary skill in the art with a reason to produce the claimed invention.

Since the applied references do not teach or suggest all of the limitations of claim 1 and there is no reason that would have prompted combination of the applied references, the obviousness rejection is improper and should be withdrawn.

Dependent claims 2-5, 7-10, 13, 14, 18, and 22-25, are allowable, *inter alia*, as depending from an allowable base claim.

Claim 5 is further allowable because the applied references do not teach or suggest that the gas generant is formulated to produce minimal amounts of carbon monoxide, particulates, or smoke when combusted.

Claim 7 is further allowable because the applied references do not teach or suggest that the gas generant is formulated to produce less than 1 percent of an original weight of the gas generant in particulates or smoke.

Claim 8 is further allowable because the applied references do not teach or suggest that substantially all of the at least one gaseous combustion product forms the inert gas mixture.

Claim 9 is further allowable because the applied references do not teach or suggest that the at least one solid combustion product is formulated to minimize production of particulates during combustion of the gas generant.

Claim 10 is further allowable because the applied references do not teach or suggest that the at least one solid combustion product is a slag.

Claim 13 is further allowable because Drakin and Bennett do not teach or suggest that the gas generant is formed into a geometry that provides a neutral burn when combusted.

The applied references also do not teach or suggest all of the limitations of amended claim 57. Drakin and Bennett, alone or in combination, do not teach or suggest the limitations of "igniting at least one gas generant to produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health value" and "dispersing the inert gas mixture comprising carbon dioxide in a concentration less than or equal to the concentration pyrotechnically produced by the at least one gas generant," as recited in claim 57, for substantially the same reasons as discussed above.

In addition, there is no reason in the prior art, common knowledge, or the nature of the problem itself that would have prompted combination of the applied references for substantially the same reasons as discussed above.

Since the applied references do not teach or suggest all of the limitations of claim 57 and there is no reason that would have prompted combination of the applied references, the obviousness rejection is improper and should be withdrawn.

Dependent claims 58, 60-65, 69, 72-75, 77, and 78 are allowable, *inter alia*, as depending from an allowable base claim.

Claim 69 is further allowable for substantially the same reasons as claim 5.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of U.S. Patent No. 6,474,684 to Ludwig *et al.*

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of U.S. Patent No. 6,474,684 to Ludwig *et al.* ("Ludwig"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Ludwig are as summarized in the response filed on May 29, 2007, and, therefore, are not repeated herein.

Claim 11 is allowable, *inter alia*, as depending from an allowable base claim.

In addition, the obviousness rejection of claim 11 is improper because the applied references do not teach or suggest all of the claim limitations. Specifically, Drakin, Bennett, and Ludwig, alone or in combination, do not teach or suggest the limitation of "wherein the inert gas mixture comprises nitrogen and water." The Examiner relies on column 12, line 27 of Ludwig as teaching this limitation. Office Action of March 1, 2007, p. 3. However, Applicants' review of the cited section of Ludwig does not support the Examiner's position. Instead, the cited section of Ludwig discusses pressing a gas generant charge into a pellet, tablet, or other form.

Drakin, Bennett, and Ludwig, alone or in combination, also do not teach or suggest the above-mentioned limitations of claim 1. Since claim 11 depends from claim 1, claim 11 includes these limitations of claim 1. Ludwig does not cure the above-mentioned deficiencies in Drakin and Bennett and, therefore, does not teach or suggest the above-mentioned limitation.

Since the applied references do not teach or suggest all of limitations of claim 11, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of U.S. Patent No. 6,093,269 to Lundstrom *et al.*

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of U.S. Patent No. 6,093,269 to Lundstrom *et al.* ("Lundstrom"). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 12 is allowable, *inter alia*, as depending from an allowable base claim.

Since the applied references do not teach or suggest all of limitations of claim 12, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of U.S. Patent No. 5,538,568 to Taylor *et al.* and U.S. Patent No. 5,882,036 to Moore *et al.*

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of U.S. Patent No. 5,538,568 to Taylor *et al.* ("Taylor") and U.S. Patent No. 5,882,036 to Moore *et al.* ("Moore"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Moore and Taylor are as summarized in the response filed on May 29, 2007, and, therefore, are not repeated herein.

Claim 15 is allowable, *inter alia*, as depending from an allowable base claim.

In addition, claim 15 is allowable because the applied references, alone or in combination, do not teach or suggest all of the claim limitations. Since claim 15 depends from claim 1, claim 15 includes all of the limitations of claim 1. However, Taylor and Moore do not cure the above-mentioned deficiencies in Drakin and Bennett and, therefore, do not teach or suggest the above-mentioned limitations of claim 1.

Since the applied references do not teach or suggest all of limitations of claim 15, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.*

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.* ("Hinshaw"). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 16 is allowable, *inter alia*, as depending from an allowable base claim.

Since the applied references do not teach or suggest all of limitations of claim 16, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of U.S. Patent No. 5,739,460 to Knowlton *et al.*

Claims 19-21 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of U.S. Patent No. 5,739,460 to Knowlton *et al.* ("Knowlton"). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 19-21 are allowable, *inter alia*, as depending from an allowable base claim, namely claim 1. Claim 76 is allowable, *inter alia*, as depending from an allowable base claim, namely claim 57.

In addition, the applied references do not teach or suggest all of the limitations of claims 19-21 and 76 because the applied references, alone or in combination, do not teach or suggest a heat management system that comprises a phase change material (claim 19) or flowing the inert gas mixture over a phase change material (claim 76). Since the applied references do not teach or suggest a phase change material, the applied references necessarily do not teach or suggest that the phase change material in the heat management system comprises lithium nitrate, sodium nitrate, potassium nitrate, or mixtures thereof (claim 20) or that the fire suppression system is configured to transfer heat from the inert gas mixture to the phase change material (claim 21).

While Knowlton teaches lithium nitrate, sodium nitrate, or potassium nitrate are present in an autoignition composition, Knowlton does not teach or suggest that these components are present in a "heat management system positioned and configured to reduce a temperature of the inert gas mixture," as recited in claim 3, upon which claims 19-21 directly or indirectly depend. Rather, the autoignition composition of Knowlton produces heat to initiate combustion of the gas

generator composition of Knowlton. Similarly, claim 76 depends from claim 74, which recites "exposing the inert gas mixture to a heat management system."

Since the applied references do not teach or suggest all of limitations of claims 19-21 and 76, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett

Claims 26-28, 31-42, 45, 48, 49, and 53-56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 26-28, 31-42, 45, 48, 49, and 53-56 are allowable, *inter alia*, as depending from an allowable base claim.

Since the applied references do not teach or suggest all of limitations of claims 26-28, 31-42, 45, 48, 49, and 53-56, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Ludwig

Claim 43 and 59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Ludwig. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 43 and 59 are allowable, *inter alia*, as depending from allowable base claims, namely claims 1 and 57, respectively.

In addition, the applied references do not teach or suggest all of the claim limitations. Specifically, Drakin, Bennett, and Ludwig, alone or in combination, do not teach or suggest the limitation of "wherein the inert gas mixture comprises nitrogen and water," for substantially the same reasons as described above for claim 11. Drakin, Bennett, and Ludwig, alone or in combination, also do not teach or suggest the above-mentioned limitations of claims 1 and 57 for substantially the same reasons as described above.

Since the applied references do not teach or suggest all of limitations of claims 43 and 59, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Lundstrom

Claim 44 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Lundstrom. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 44 is allowable, *inter alia*, as depending from an allowable base claim.

Since the applied references do not teach or suggest all of limitations of claim 44, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Taylor and Moore

Claims 46 and 70 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Taylor and Moore. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 46 and 70 are allowable, *inter alia*, as depending from allowable base claims, namely claims 1 and 57, respectively.

In addition, claims 46 and 70 are allowable because Drakin, Bennett, Taylor, and Moore, alone or in combination, do not teach or suggest all of the limitations of claims 46 and 70 for substantially the same reasons as described above for claim 15.

Since the applied references do not teach or suggest all of limitations of claims 46 and 70, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Taylor and Hinshaw

Claims 47 and 71 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Taylor and Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 47 and 71 are allowable, *inter alia*, as depending from allowable base claims, namely claims 1 and 57, respectively.

Since the applied references do not teach or suggest all of limitations of claims 47 and 71, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in View of Bennett, and Further in View of Knowlton.

Claims 50-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Bennett, and further in view of Knowlton. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 50-52 are allowable, *inter alia*, as depending directly or indirectly from an allowable base claim, namely claim 1.

In addition, claims 50-52 are allowable because Drakin, Bennett, and Knowlton, alone or in combination, do not teach or suggest all of the limitations of claims 50-52 for substantially the same reasons as described above for claims 19-21.

Since the applied references do not teach or suggest all of limitations of claims 50-52, the obviousness rejection is improper and should be withdrawn.

## ENTRY OF AMENDMENTS

The amendments to claims 1, 3, 18, 19, 24, 26, 57, 59, 72, and 107 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

Applicants consider claims 1, 57, and 107 to be generic, and note that upon allowance of a generic claim, claims depending therefrom in a non-elected species would also be allowable.

## CONCLUSION

Claims 1-5, 7-16, 18-67, 69-90, and 94-115 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

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